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SUNDERLAND PEACOCK ARCHITECTS

07/09/12 - 4282

Design and Access Statement
with Structural Statement
Merrybent Hill Farm, Catlow Road, Slaidburn



Approach to Merrybent Hill Farm

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Introduction

Merrybent Hill Farm is situated approximately 5 miles to the North of Slaidburn, just off the Catlow Road and accessed by a farm track. The farm has not been "worked" since 2005 remaining empty to the present day. Merrybent no longer has any farm land attached and as such a small holding is no longer viable.

Planning permission has been granted (application 3/2010/1019) to extend the habitable accommodation into the barn. This subsequent application is to include the existing sheep pen as part of the habitable accommodation. The current approval indicates this area as a workshop. This revised proposal will utilise this as part of the dwelling, affording access to the existing mezzanine hay loft in the barn and also other internal amendments. This use of the existing sheep pen for the stair will maintain the internal form of the barn, free from obstructions.

Listing

The house is listed, listing description as follows 16.11.1954

House, possibly early C18th. Slobbered rubble with slate roof. 2 storeys, 2 bays. Windows rebated and chamfered with mullions, all of 3 lights. A central one-storey gabled porch has a plain stone door surround with '1688 AV' roughly carved on the lintel. Chimneys to the right of the porch and to the left of the first bay. At the far left is a unit now with a modern garage entrance on the ground floor and a modern copy of a 3 light mullioned window on the first floor. There is an outshut to part of the rear of the house, which has windows with just plain reveals.

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Design

Merrybent Hill Farm is a linear development with the main house constructed from line washed stone. The attached barn from random stone with smooth stone surrounds to the openings. There is a further stone building and a half stone half clad machinery / cattle shelter.

This amended proposal has no external alterations to the previously approved scheme. The internal amendments have been designed to be sympathetic to the existing building. The main revision is the omission of the first floor bedroom and en suite over the barn. This retains the open internal form of the barn, with the roof structure fully exposed internally and omits a new first floor opening into the previous bedroom. The existing hay loft is also to be retained as a mezzanine, with a new first floor opening from the sheep pen.

Within the main dwelling, the modern staircase is to be removed and a new stair is to be constructed in the suspected original position in the outshot. This affords better circulation within the dwelling.

The ground floor door to the family bathroom in the outshot and door at first floor into the outshot have been identified by the conservation officer as being of historical merit to the building. They are to be retained within the proposed scheme.

Structural Statement

This is not a full structural survey.

The main load bearing walls on the barn vary between 600mm and 800mm thick random stone and probably consist of two leaves of stone with rubble infill. The internal dimensions are 8.7m x 5.5m. The barn is accessed by a large opening 2.3m wide and the internal space is full height. The roof is supported by two timber king post trusses, purlins and rafters. Viewed from the ground the timber trusses generally look to be in good order.

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Barn Roof Showing King Post Trusses



North west elevation of barn- the existing openings will be utilised as windows.

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South East Elevation of Barn



Barn entrance, details of random stone and the general sound condition of the building.

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The roof of the barn is covered with stone flags. These will require carefully removing for the replacement of the existing slate battens with the addition of a breathable membrane and carefully re fixing. A thorough appraisal of the primary timber will be undertaken at this time.



A small amount of movement is evident in this photograph. This area will require rebuilding to structural engineers details (approximately 5% of the overall external wall)

It is proposed to install a breathable, lightweight slab as apposed to cement based concrete, (see appendix) to the ground floor and build up internal insulated block walls to comply with current building regulations and also to support the part first floor.

Conclusion

It is our opinion that the existing barn will convert easily and sympathetically into habitable accommodation.

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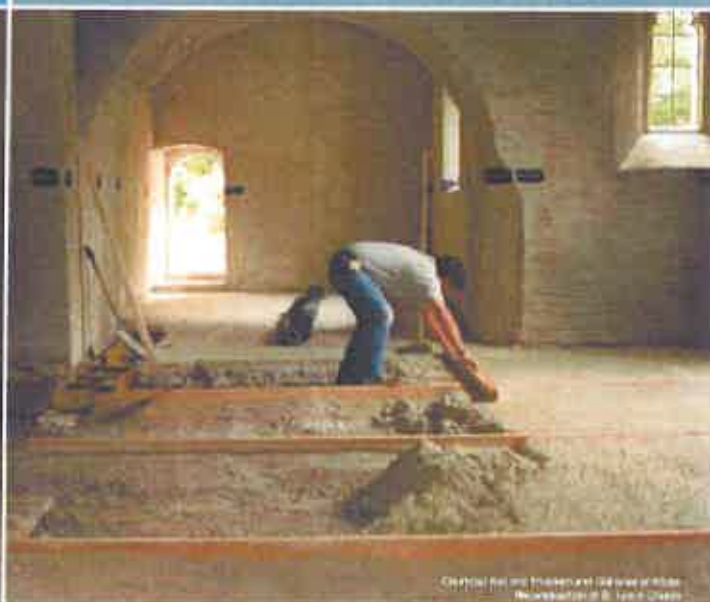


www.lime.org.uk

Tŷ-Mawr

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limecrete floor



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Deddf Hawlfraidiol 1988, S. 107(2) - 107(2)

insulated



...breathing life into buildings...

We, at Tŷ Mawr Lime Ltd, designed this innovative flooring system in 1988 as a **breathable, lightweight alternative to cement-based concrete** for use in old and historic properties. Over the years, we have selected and tested various materials and combinations of materials to both simplify the installation process and improve the 'green' credentials of the floor. It is therefore now being used more and more in ecological new builds.

In 2008, our insulated limecrete flooring system received **LABC (Local Authority Building Control) system type approval**, this means that it is now easier for you to receive Local Authority Building Control approval wherever you are in the UK.

Caring for buildings...Caring for this environment...Caring for health...

Gofalwch am adeiladau... Gofalwch am yr amgylchedd... Gofalwch am iechyd...

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insulated limecrete floor ...bre



Creating the base in Chesham, Bucks

history

We know that lime has been used since Roman Times either as mass foundation mortars or as lightweight concrete using a variety of aggregates combined with a wide range of porous (finer material) that help to achieve increased strength and speed of set. This meant that lime could be used in a much wider variety of applications than previously such as floors, walls or domes.

Over the last decade, there has been a renewed interest in using lime for these applications again (after the domination of Portland Cement over the last 50 years or so). At Ty-Mawr, we have been involved in researching and developing different systems for lightweight insulated floors. The Ty-Mawr insulated limecrete floor comprises of three layers:



Two workers laying out the Ty-Mawr insulated limecrete floor

the limecrete slab

The limecrete slab is a blend of hydraulic lime and pumice - a naturally fired aggregate. This was extensively used by the Romans. The mix is lightweight, vapour permeable and helps with thermal resistance. In the slab layer which is the main load bearing element in the floor, it is here that underfloor heating pipes are laid.

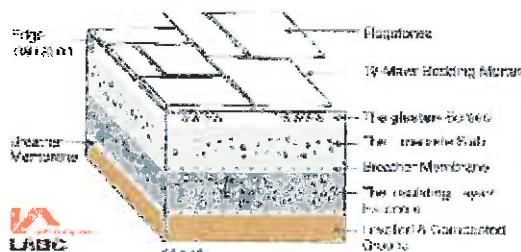
the glaster screed

This layer is required if heating (in the form of underfloor heating) is to be incorporated into the floor. It acts as the thermal store for the heat which is distributed through the pipes.

Again, in trying to improve the thermal insulation of the floor, the glaster screed is a blend of recycled glass aggregate and a hydraulic lime mortar.

floor finish

The finish should be vapour permeable and, since it will be exposed to any time moisture but should not be laid and pointed up with a fine mortar. A good quality flooring material, timber flooring is also possible but should be left over on the floor for several weeks with the heating running on low before permanent fixing. An air gap must be maintained between the lime screed and the floor boards. This air gap is necessary to prevent timber floor warping. However, it can affect the performance of under floor heating systems and so needs careful consideration.



Edge detail
Breather Membrane
LABC

the insulating layer

This layer acts as a moisture break as well as providing the insulation for the floor. We offer two alternative materials for this layer: 'Hascor' recycled foaming aggregate or coated LCA (lightweight expanded clay aggregate). The 'Hascor' foaming aggregate offers some environmental advantages in that it is recycled (as opposed to capturing a natural, finite resource) and is fired at a lower temperature to LCA. It also has a significantly lower bulk density (about 100kg/m³) which offers energy and cost savings in terms of transport. The 'Hascor' product is also dimensionally stable (being angular) which makes it easier for those working with the material (preparing the mix). Unlike the LCA, it does not require a 'light' bonding LCA is the more standard alternative.



Working in a confined space
Chesham House, Bucks
Manselton Gardens

Ty-Mawr Lime Ltd 01844 611184 www.tymawr.co.uk

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...strong...flexible...easy to use...

Strength

In general terms, the maximum strength that it is possible to achieve using a lime based mix is around 160 N/mm². This exceeds the strengths needed in domestic construction by a considerable margin of safety.

Using the Retlex hydraulic lime, the tests we have commissioned show the following results:

Age (days)	Compressive Strength (N/mm ²)	Density (kg/m ³)
7%	4.5	1440
56	8.5	1420
84	11.3	1440

Typical distribution of results of hardened concrete: 28 days: 40-100 N/mm²
 Method of testing: 100 mm cubes, 100 mm diameter, 100 mm x 100 mm x 100 mm

Sample	Flexural Strength (N/mm ²)	Density (kg/m ³)
18th Nov Sample 1	11.8	1380
23rd Nov Sample 2	1.3	1410

3. Compressive strength of concrete: 28 days: 40-100 N/mm²
 Method of testing: 100 mm cubes, 100 mm diameter, 100 mm x 100 mm x 100 mm
 4. Flexural strength of concrete: 28 days: 1.3-11.8 N/mm²

are contraction/expansion joints necessary?

Our research has shown that the considerations applicable to cement/lime concrete with regard to expansion joints are not applicable to lime based concrete. Hydraulic lime generates little heat during the initial hydration process and lime concrete has a good flexural strength to compressive strength ratio. These properties mean that large savings can be made in terms of the labour and equipment usually required to replace dowels and induce contraction joints in cement concrete ground levelling class.

can it be used with underfloor heating?

If under floor heating is to be included in the floor system, then a further layer of material is needed - this is the glass fibre screed layer which provides a thermal store for the heat distributed through the pipe work.

Heat loss through the floor is controlled by the insulation layers beneath (as detailed above). No other insulation material is required beneath the screed but it is advised that you use suitable edge insulation where the screed meets any external wall or other vertical structure.

Installation

No special skills are required for installing the limecrete flooring system. It is not unlike laying a conventional cement-based concrete floor, a contractor with experience in laying floors should be willing and able to do it. Excavation, layer depths and full installation instructions are supplied with the paving components. Ty-Mawr is renowned for its product support, providing free telephone support and site visits if necessary.

For larger floors, we have a range of mixers and silos available for hire to speed up the mixing process and work with other experienced installation contractors, please contact us for details.

Concrete is the most common construction material used in the world. Cement is the principal ingredient in concrete. Producing one tonne of cement results in the emission of approximately one tonne of CO₂, created by fuel combustion and the combination of raw materials. Cement manufacturing is a source of greenhouse gas emissions, accounting for approximately 7% to 10% of CO₂ globally. The cement industry has made significant progress in reducing CO₂ emissions through improvements in process and efficiency, but further improvements are needed because CO₂ production is inherent in the basic process of calcining limestone. Lime is burnt at a lower temperature and has a higher lime/lime contact than cement so that the carbon dioxide reabsorption of lime is greater than that of cement. Importantly, it also allows the floor to be recycled at the end of its useful life. This also helps to address some of the concerns we have about the level of construction waste going to landfill. In the UK this is currently 70-80 million tonnes per year - completely unsustainable.



Typical paving machine in use.

"Thanks for your help in organising the machines. I'm very satisfied with the results of the floors that were much easier than I thought to lay - and much cheaper than the quotes I got from other people."

DEL, MILTON KEYNES.

**Distribution warehouse:**

100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

For further information on any product or system, in this leaflet or to keep up with developments at Ty-Mawr, please visit our website www.ty-mawr.co.uk and register for regular updates.

Our commitment to the environment is a core value. We are committed to reducing our carbon footprint and to using sustainable materials. We are also committed to using renewable energy sources. We are committed to using sustainable materials. We are committed to using renewable energy sources. We are committed to using sustainable materials. We are committed to using renewable energy sources.